

## CLAIMS

- 1 1. A communications network switch including a plurality of network ports for transmitting  
2 and receiving packets to and from network nodes via network links, the switch being operative to  
3 communicate with at least one trunking network device via at least one trunk formed by a  
4 plurality of aggregated network links, the trunk being coupled with a corresponding trunked port  
5 including a subset of the network ports that are coupled with corresponding ones of the  
6 aggregated network links of the trunk, the switch comprising:  
7 packet buffering means coupled with the network ports, said buffering means for  
8 temporarily storing a packet received at a source port, said packet having a source address value,  
9 and a destination address value indicating a destination node that is communicatively coupled  
10 with said switch via a data path including a trunk;  
11 packet routing means coupled to communicate with said buffering means, said routing  
12 means for determining a destination trunked port associated with said packet, said destination  
13 trunked port including a subset of the network ports, said destination trunked port being coupled  
14 to said destination node via said data path; and  
15 trunked link load balancing means coupled to communicate with said routing means, said  
16 load balancing means for selecting a destination port associated with said packet from said subset  
17 of network ports of said destination trunked port;  
18 whereby transmission loading of the aggregated network links of said trunk is balanced.
- 1 2. A communications network switch as recited in claim 1 wherein said load balancing  
2 means is responsive to a source port ID value indicating said source port, and is operative to  
3 select said destination port as a function of said source port ID value.
- 1 3. A communications network switch as recited in claim 1 wherein said load balancing  
2 means is responsive to said source address value of said packet, and is operative to select said  
3 destination port as a function of said source address value.

1 4. A communications network switch as recited in claim 1 wherein said load balancing  
2 means is responsive to said corresponding source and destination address values of said packet,  
3 and is operative to select said destination port as a function of said source and destination address  
4 values.

1 5. A communications network switch as recited in claim 2 wherein said packet routing  
2 means includes a packet routing table which is responsive to said destination address value, and  
3 which is operative to provide a trunked port ID value indicating said destination trunked port.

1 6. A communications network switch as recited in claim 5 wherein said load balancing  
2 means comprises:

3 a system administration unit providing a plurality of port mapping values, each of said  
4 port mapping values being associated with a corresponding one of the network ports, each of said  
5 port mapping values including a plurality of port select values, each of said port select values  
6 being associated with a corresponding one of a plurality of trunked ports of the switch, each of  
7 said trunked ports including a corresponding subset of the network ports, each of said port select  
8 values indicating a corresponding selected one of said corresponding subset of network ports of  
9 said associated trunked port;

10 a trunk port configuration unit coupled to receive said port mapping values from said  
11 system administration unit, and including a plurality of configuration registers for storing  
12 corresponding ones of said port mapping values; and

13 an address resolution circuit coupled with said trunk port configuration unit, and  
14 including,

15 a first multiplexer having a plurality of inputs for receiving corresponding ones of  
16 said port mapping values, a control port responsive to said source port ID value, and an  
17 output providing a selected one of said port mapping values in response to said source  
18 port ID value being applied to said control port of said first multiplexer,

19 a destination register coupled to said first multiplexer for storing said selected port  
20 mapping value, and having a plurality of outputs each providing a corresponding one of  
21 said port select values, and

22           a second multiplexer having a plurality of inputs coupled to said outputs of said  
23           destination register, a control port responsive to said trunked port ID value, and an output  
24           providing a selected one of said port select values in response to said trunked port ID  
25           value being applied to said control port of said second multiplexer, said selected port  
26           select value indicating said destination port.

1     7.     A communications network switch as recited in claim 6 wherein said system  
2     administration unit comprises a processing unit and a computer readable memory unit, and  
3     wherein said port mapping values are programmable by a user.

1     8.     A communications network switch as recited in claim 3 wherein said load balancing  
2     means comprises:

3           a register for storing said source address value of said particular packet, said register  
4           including at least one register output, each register output providing a port select value derived  
5           from said source address value, said port select value for indicating a selected one of a plurality  
6           of network ports of a destination trunked port associated with said particular packet.

1     9.     A communications network switch as recited in claim 8 further comprising a multiplexer  
2     having a plurality of inputs for receiving corresponding one of said port select values, a control  
3     port responsive to a predefined bit select value, and an output providing a selected one of said  
4     port select values.

1     10.    A communications network switch as recited in claim 4 wherein said load balancing  
2     means comprises:

3           a first register for storing said source address value of said packet, said first register  
4           including at least one output providing a corresponding first value derived from said source  
5           address value,

6           a second register for storing said destination address value of said packet, said second  
7           register including at least one output providing a second value derived from said destination  
8           address value,

9           an exclusive NOR logic unit responsive to said first and second values, and operative to  
10   provide a port select value for indicating a selected one of a plurality of network ports of a  
11   destination trunked port.

1   11.    A communications network switch as recited in claim 1 wherein the trunking network  
2   device is a high speed server having a network interface card providing for trunked link  
3   communication.

1   12.    A communications network switch as recited in claim 1 wherein communication via the  
2   network links is implemented in accordance with ETHERNET.

1   13.    A communications network switch as recited in claim 1 wherein each of the network  
2   links has a bandwidth of 100 Megabits per second, and each of the trunked links provides a  
3   bandwidth 400 Mbps

1   14.    In a communications network switch having a plurality of network ports for transmitting  
2   and receiving packets to and from network nodes via network links, the switch being operative to  
3   communicate with at least one trunking network device via a trunk including a plurality of  
4   aggregated network links, the trunk being coupled with a corresponding trunked port including a  
5   subset of the network ports that are coupled with corresponding ones of the aggregated network  
6   links of the trunk, a method for balancing the transmission loading on each of the links of the  
7   trunk, the method comprising the steps of:  
8           receiving a packet at a source port of the switch, said packet having a source address and  
9   a destination address indicating a destination node that is communicatively coupled with the  
10   switch via a data path including a trunk;  
11          determining a destination trunked port associated with said packet, said destination  
12   trunked port including a subset of the network ports, said destination trunked port being coupled  
13   to said destination node via said data path; and  
14          selecting a destination port associated with said packet from said subset of network ports  
15   of said destination trunked port.

1 15. In a communications network switch as recited in claim 14 wherein said step of selecting  
2 said destination port includes:

3 receiving a source port ID value indicating said source port; and  
4 determining said destination port as a function of said source port ID value.

1 16. In a communications network switch as recited in claim 14 wherein said step of selecting  
2 said destination port comprises selecting said destination port as a function of said source address  
3 of said packet.

1 17. In a communications network switch as recited in claim 14 wherein said step of selecting  
2 said destination port comprises selecting said destination port as a function of said source address  
3 and said destination address of said packet.